

84a
Mercurius Centralis :

O R,

A Discourse

OF
Subterranean C O C K L E,
Muscle, and Oyfter-shells,

Found in the digging of a Well at
Sir William Doylie's in Norfolk,
many foot under ground, and at
considerable distance from the Sea.

Sent in a Letter to Thomas Brown, M.D.
By *THO. LAWRENCE, A.M.*

L O N D O N :

Printed by J.G. for R. Royston, and are to be sold
at the Angel in Ivie-lane. 1664.

35

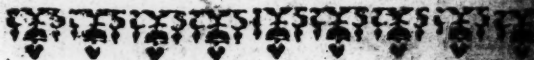
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June 13. 1664.

Roger L'Estrange



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O F

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581d



TO THE
Reader.

READER,



*Am unwilling
to make those
Common -
Pleas (with
which thou hast been
sufficiently tired already)*

A 4

dy)

The Epistle

dy) for my exposing this to the publick, lest I become as censurable for these, as for the Tract itself. I must confess that I sent it willingly into the light; and although I cannot pretend any general good in it, yet it may be useful to some ~~that~~ are studious of Natures book, as another mans discoveries or rational Discourses
may

To the Reader.

*may be to me. I do not
fear to say, that I have
so much doated on the
Volumes of the Crea-
tion, that as I cannot
think the meanest of
Gods creatures so de-
spicable but that its
contemplation deserves
to be matter of business
as well as of diversion
to the wisest; so (to those
that are considerate and
observing) the Arcana*

The Epistle

Naturæ, or (if it be law-
ful so to call these) the
magnalia Dei, are much
more valuable and
worth our search. If I
have discovered any
thing in this little hand-
ful, as I hope I have;
or if the discovery can
be to any, any way use-
ful, as I hope it may be,
either to satisfy, or at
least to actuate them to a
further inquiry. (the
Field

To the Reader.

Field is large enough,
we need not juggle I
have my design. And
though it were, or be
but a partial detecting
of a concealed truth;
yet even that will hide
some indiscretions in
the management. How-
ever as he said of Evils,
Μυρία κρύπτεται καὶ μυχός. I may
say of my faults, The
secrecy of the business
discoursed will hide the
errors.

To the Reader, &c.

*errors of the discour-
ser. But if thou shouldst
judge me fond of a
phanſie or invention,
I ſhall not fail of thy
excuse, ſince I am not
the firſt that have run
naked into publick
with an *Evgenia* in my
mouth; what is amiſs
amend, and*

Farewell.

T. L.

Mercurius Centralis :

OR,

A DISCOURSE

OF

*Subterranean Cockle, Muscle;
and Oyster-shells, found in
the digging of a Well, &c.*

DOctor, I have made
the best inquiry I
could in so short a
time, after the truest cause
of that vein of Cockle and
Muscle-shells that was dig-
ged up in Norfolk, so ma-
ny foot deep under the sur-
face

face of the Earth. And upon my most serious examination do believe, that that *reason* which I casually bolted out when you first mentioned it to me, is the most *likely* and *probable*, if not the only that can be given of it; of which I will give more than empty conjectures in the following Discourse. But before I come to unfold that my *opinion*; I will insist on some things that relate to it, both for *method* sake, and

and to gain a little the more Reputation to it; and then will give you, or any else leave to judge of it as you shall think fit; nor shall it displease me if any are of a different judgment.

God that made the Universe for Mans use and delight, hath beautified it with infinite varieties. In the *animal* kingdom, what diversity of Creatures, Volatile, Reptile, Natant, and Gradient? How different their shape, use, colour

low, greatness, and smallness,
their sents, their tempers,
natures ? How various
their amities, enmities, sym-
pathies, and antipathies ?
In the *Vegetable* kingdom,
how different their shapes,
proportions, colours, orders,
tastes ; the first, second and
other qualities of their
leaves, flowers, roots, barks,
seeds, fruits, tears, and
gumms ? Nor is Nature less
skilful in generating and
ordering the strange *Forms*
and *Figures* of *Subterraneal*
bodies. Amongst an hun-
dred

dred thousand *stones* on a *strand*, a man shall not find *two* that in all things *exactly agree*; and yet there is many times some more *general* and *gross likeness*.

But if we examine the several *species* of *Mineral bodies*, there will be visible an admirable and pleasing variety. Some are seen in the form of *Cylinders*, of which I have been present when many thousands have been taken out of *Marle-pits*. Some are exactly *spherical* like

6. *Mercurius Centralis.*

*Ovied.
lib. 17.*

like Bullets, but much bigger; so equally round that no art can be more exact, and of them many *Ship loadings*, between two Hills in *Cuba*. Many hundred *flints* in the same form I have found dispersedly near the place I live in: In which also I have observed that their coat and external covering is white; next to that the stone is very black; but nearer to the Centre it is of a brighter colour, in which by the help of a *Microscope*

I have seen as it were little sparkling Diamonds; in others of the same form I have found with my naked eyes many thousand such sparkling stones as big as pins-heads, and some as big as small barley-corns, of an excellent lustre when they are held in the Sun. I have seen likewise *Fossiles Aetites*, if I may so call them; stones in an Oval shape as big as Pigeons Eggs, hollow in the inside, and impregnate with lesser stones, which on the shaking

king betray'd themselves by their sound, as the kernels in the dry stones of Peaches. Diamonds, and our Cornish and Bristol stones are all generated with Mr. S. S. spires or points. A friend of mine imparted to me a fluor that grew on a rocky stone that is very clear and shoots in the same form, and is so hard that it will cut glass. Some are seen in the form of Cones, some of Pyramids, some of Semispheres, and gutter'd and furrowed on the sides like

like the pummels of some
Swords; some smooth, some
writhed. Crystal doth shoot
in sexangulos. I saw stones
digged out of a little Ca-
vern by a Springs-side be-
tween St. Ives and Somer-
sham in Huntingdon-shire,
every one of them had the
same Figure, and were in
compais sexangular, with
two broader and more
depressed superficies, on ei-
ther side it made a perfect
Rhomboides, clear as Cry-
stal, but very soft and apt
to scale; of which none
knew

knew any considerable use: only the powder of it was found good to Cicatrize green wounds. And indeed almost all sorts of *stones*, whether more choice and *orient*, or more base and vulgar, have for the most part besides their different virtues, several *Figures* and *Colours*. But these are mean, low and common observations. What shall we think of that, *Cornu Monocerotis fossile*; those *ossa subterranea & fossilia*, which

which are very often generated of *osteocola* and the like substances, and have given complexion to those stories of * Gyantick races * ^{Not} ^{that I} deny that there have been men of vast bodies in several ages. The Sons of Anak were without question very great men. Goliah and others mentioned were Giants. We read of Giants famous from the beginning, that wer of so great stature and so expert in war, Baruch 3.26. of the Sons of the Titans and high Giants, Judith 16. 7. At Coggeshall were found two teeth that might have been cut into two hundred of an ordinary size. Camb. de Trinobant. St. Augustine saw such an one at Utica. But these even in the Scripture, the most exact history in the world, are recorded as rare; so that I do not believe that they have been common in any Country, much less that any Country hath been inhabited by only such. An old Poet cited by our Anti-quary

quary speaking that Cornwall was the seat of
some, saith they were but few.

— — — — — *Titanibus illa*

Sed paucis famulosa domus.

Vid. Hackwell in Apolog. de hoc subjecto.

in several Countries; be-
cause this, like bones of
men, hath been found of a
vast bigness? What shall
we think of those bones of
Fish, and such Subterranean
Muscle and *Oyster-shells*
found at Darmstadt in the
Palatinate, and at other
places near *Heidelberg*, and
in *Silesia*, and those you
mentioned to me? At
New-house a seat of one
Mr.

Mr. *Eyres* in *White-Parish*
in the County of *Wilts*, as
they were digging of a
Well about *thirty foot deep*
(as it was related to me)
between two veins of sand
were found infinite num-
bers of *Oyster-shells* in a
bed, both *shells* closed to-
gether, and nothing dis-
cernable between them
but a little *dust*. But far-
ther yet, what can we say
of those *Tables of stone* in
which are seen the *Pi-
ctures* of divers *Planets*, of
Frogs, *Serpents*, *Salaman-
ders*;

*Epitom.
Phys.lib.
5.cap.4.*

ders; nay, *Principum & illustrium virorum* images, as *Sennertus* saith are found in *Islebia*? I my self have seen an *Agate* with a natural foil like a *Black-moores* head, and another like an *Oaken* leaf, that some have went to brush away, and yet it was within the stone, and so exact too, that it deceived the very sight. *Erasmus* describeth one that he saw in *England* in a *Temple* at the feet of the image the *Virgin Mary*, in which there

there was the form of a
 Toad. I will set it down
 in his own words. Og. *Erasm:*
Ad pedes Virginis est gemma *Coll. Pe-*
cui nondum apud Latinos aut *grin. re-*
Græcos nomen inditum est, *lig. Ergo.*
Galli à Bufone nomē dederunt,
eo quod bufonis effigiem sic ex-
primat, ut nulla ars idem possit
efficere. Quodq; majus est mi-
raculum; pusillus est lapillus;
non prominet bufonis imago,
sed in ipsa gemma velut inclu-
sa pellucet. This, Menede-
 mus that discourseth with
 him, imputes rather to
 the fancy of the beholder;
 B as

as Children think they see heads, and faces, and bulls, and swords, in the Clouds. But he answereth. *Imò nè sis nesciens, nullus bufo vivus evidentius exprimit seipsum quam illic erat expressus.* And from his companions incredulity taketh occasions largely to discourse the strange forms of stones. Now although it be impossible to find out the certain causes of these most noble and reclusive works of Nature, these being

being such things where-
in we have very great rea-
son to admire the *provi-*
dence of God, and his most
perfect work-man-ship, that
hath given to each crea-
ture (as Scroder calls it)
rationem seminalem; or as
Severinus, the knowledge or
science of its own proper
form. And indeed some
of them are in this as cer-
tain as the most *voluntary*
agents. And even those
which casually obtain
these shapes may be
guessed at, for (besides
B 2 the

the *lufus naturæ*, which
 most flie to) the creatures
 they represent may be pe-
 trefied, à *spiritu lapidescente*;
 or may be inclosed as in a
Coffin in the purer uncon-
 crete matter of stones;
 which being speedily har-
 dened, and those in some
 measure *affimilated* to that
stony substance, their linea-
 ments *shine through*, as *Flies*
cased in Amber are seen
 almost as clearly as if they
 were out of it. And par-
 ticularly for such *shells* we
 are now to discourse of,
 there

there may be some conjecture had of some of their *forms*; and this brings me to distinguish between *Muscle* and *Cockle-shells* really, and such in *shape* and *appearance* only; for I have seen many *stones* in the *shape* of these, which I imagine were thus made. The *Oyster*, *Muscle*, or *Cockle-shells*, lying in such places where they have been cast out by men, have casually received the *succus lapidescens*, or unconcrete matter of *stones*, and

B; have.

have become a *bed* or *matrix* to it; and so hath that *stone* been shapen according to this *mould*, as *gourds* while they are young put in *glassses* grow not according to their usual natural *form*, but according to the *shape* and *proportion* of the *glassses*.

2. If they were really *Muscle* and *Cockle-shells*, that could not be the *place* of their *generation*, but they must be by some *violence* and *impetuosity* hurried thither; and for their
loco-

loco-motion we can find no other *Media* than the *earth* or *air*. And first for the *air*. Those that have failed to the *Indies* can inform you with what force *Hir- canoes* or *Turbines* (which some distinguish ; but I think that there is no other difference between them, than that the *Hir- cano* is a circumagitation of the *air* or *whirlewind* tending downwards ; and the *Turbo* the *whirlewind* tending upwards) the meeting together of contrary furi-

*Hackl-
jt. Disc.
to.3. p.
100.*

ous winds, have taken up
whole Seas of water ; and
what should hinder them
that when they fall foul
near a shore, they should
not rake the Seas, and
carry other bodies besides
the water? Some Mariners
in the North-west discovery
were eye-witnesses of such
a whirlwind, that for the
space of three hours toge-
ther, took up vast quan-
tities of water, furiously
mounting them up in the
air. And altogether as
strange hath the force of
it

it been on dry ground; of which Bellarmine gives us *Bell. de Ascens. mont. in Deum, Grad. 3. cap 4.* a relation that it is so incredible, that he premiseth this, *Quod nisi vidissem, non crederem.* He thus describeth it; *Vidi ego à vehementissima vento effossam ingentem terræ molem, eamq; delatam super pagum quendam, ut fovea altissima conspiceretur unde eruta fuerat, & pagus totus coopertus & quasi sepultus manserit, ad quem terra illa devenerat.* It is ordinary in most histories to read of bloud
fal.

Anno falling in showres, or at
ab urbe least of what is analogous to
condita bloud, of wood, wool, worms.
ccccxxx Munster * tells us of Frogs,
lac de Mice, and Rats, that fell
caelo ma- with some feculent showres
nare vi- in Norway. There is one
sans est. at this time living, that
Oros.lib. walking through a low
4. cap.5. year of the marish ground in England,
 In the fourth year of
 Ivor the son of
 Alan in Wales, it rained bloud in England and
 Ireland. Welch. chron. *Gabiis lacte pluit. T.*
Graccho, Tit. Manlio, Coss. In Gracostasi. C. C. L.
Cai. Sext. Coss. Pranesste. L. Cecil. L. Anrel. Coss.
In Agro Perusino P. Sor. G. Atil. Coss. sanguis
per biduum pluit in Area Vulcani & Concordia.
M. C. Quint. Fab. Coss. Lapid. Pluvia. In
Aventino Tusceis lapidibus pluit. Vid. Jul. Obs.
de prodig. ad fin. Plinii.
 * Munster, Cosmog. lib. 4. cap. 22.

in

in a foggie morning, had
his Hat almost covered
with little Frogs, that fell
on it as he walked: and
many at some times on
the tops of houses and leads,
have found great num-
bers of such creatures. At
Arles in France in the year
1553. Infinite swarms of *Valeriola*
Locusts fell on their fields, and *obs. lib. 1.*
immediately devoured all that *obs. 1.*
was green, *Magnâ incolarum:*
admiratione & consternatione.
So we read that by an
East wind the Locusts which
covered the face of Egypt
were

Organi-
tins.

were brought on it, & by
as a strong West wind they
were carried off again;
Exo. 10. 13, 19. Stones like-
wise have thus fallen. In
Japan, on a day when
they solemnized a great Fe-
stival to their Idol, there
fell among them a great
showre of stones, which
slew many, and put the
rest to their heels to shift
for themselves. And it
is very likely that those
showres of hail that slew so
many in several stories,
were *grandines lapidum*, (as
Lactantius

Lactantius calls those ^{*Lactant.*}
 showers of vengeance, that ^{*Dio. Just.*}
 God will at the last send ^{*l. 7. c. 26.*}
 on the Devil and his ac-
 complices) to which the ex-
 pression of *history* agrees.
 At the time of *Alexanders* ^{*Oros. l. 3.*}
 birth, *Saxea de nubibus* ^{*c. 6.*}
grando descendens, veris ter-
ram lapidibus verberavit;
 And to this is the Scripture
 consonant, *Jos. 10. 11.* For
 what is called *hail* in the
 later part of the verse, is
stones in the former. And
 as they fled from before *Israel*,
 and were going down to
 Be-

Bethoron, the Lord cast down great stones from heaven upon them unto Azekah, and they died. And that heterogeneous bodies are found in mines, and on the tops of mountains, *Arist.* Aristotle insinuates this to be the cause, *Meteor.* viz. that they are brought to such places by the winds. It seems I must confess the more colourable; that things should be brought this way from the Sea, because the Sea both of old, and more lately, hath been deemed to be the father

father of the winds. Erasmus describing Paratha-Peregr.
laffia faith, In propinquo est^{relig.}
oceanus ventorum pater, and Ergo.
the old Poet speaking of
the generation of the winds,
finds out the same cause:

Ος τε ἀρυσάμενος ποταμῶν ἀπο αἰῶ^{Hesiod.}
νός^{Oper. &}
τῆς γαίης ἀέθους ἀνέμοιο θυίαλλη. dies
P. 44.

And therefore winds have
in some places been ob-
served to be Obsequious to
the course of the Moon as
the waters are, which that
Roman Poet hints.

Thra.

Horat. Carm. lib. 4. Od. 25. Tbracio bacchante magis sub
interlunia vento,

Tis true, no man can tell
the force and fury of the
unbridled winds, that are
so mad that they know
not whence they come,
nor whither they will.
But yet were such heteroge-
neities which are found so
deep this way brought, they
should be found in all or
most places alike; and
they should be found a-
bove ground too, unless
we can imagine that
immediately on their
fall-

falling the Earth suffer
some *Chasm*, and doth in-
gulf and swallow them
into its bowels. And there-
fore it is most probable
they are brought to such
places from the Sea, the
place of their Generation,
generally under the Earth.

113. If they are brought
from the Sea to the place
they are found in, under the
Earth, it must be either by
a natural or by a supernatu-
ral impellent or mover; by spi-
rits, or by a natural vehicle.
No man that is either a
Phi

Philosopher or a Christian
can doubt of the power
of spirits, by Gods command
or permission, to effect
this and many more a-
ctions that are far more
difficult and unlikely.
And Paracelsus with some
others would have us be-
lieve that there are innu-
merable such spirits or ge-
nii that inhabit the Earth,
as he hath projected there
are Inhabitants of the
Sun, Moon, and other Pla-
nets, which he calls Solar,
Lunar, Saturnine, &c. and
of

of the air which he styles
aerial. And to their ma-
nagements referreth all
the natural motions of
Generation and Corruption,
and the violent, as of
Chasms, Earthquakes, and o-
ther alterations in the
bowels of the Earth. Nay,
they reduce them to sever-
al Classes and Orders, and
with a little invitation
would be ready to swear,
that many of them are
Engineers that contrive the
Water-works, and make Ri-
vers and Aqueducts; that
some

some are *Blacksmiths* by Trade that work in the *Vulcanoes*; that some are *Brewers* that boil *natural baths*, and use *Minerals* instead of *Mault*. But these opinions are such, that besides their own natural absurdity, our Religion will teach us to explode, and are then confuted when they are only named. For though we grant that some such things are possible to be done by the *Devil*; that is not so the Prince of the power

power of the *air*, as not to be the *God* of this *lower world*; yet to impute all things to them must needs be *asylum ignorantiae*, and a *Remora* to all ingenious and *Philosophical* disquisitions, of the nature and causes of all things and actions in the bowels of the *Earth*, and a means to make us know no more of nature than what is obvious to sense. So that I take it for granted, that some natural, ordinary vehicle there is under the *Earth* that brings

brings such heterogeneous bodies from their native and genial seat, and proper place, to such Vaults, Hills, Veins, and Caverns where they are found.

4. Now the most likely movers of all others to carry bodies of weight under the Earth are two; either exhalations or waters; for as for vapours, I look not on them as capable of carrying any thing of weight, especially so low in the Earth, where they cannot be so much rarefied, by
rea-

reason of the natural cold-
ness of that *Element*. 'Tis
true, *May-dew* which is a
vapour condensed will carry
up an *Egg-shell* in which
it is put, by the help of a
Pike or *Spear* placed by it.
But this is in the sight of
the *Sun*, and if so much as
a thin cloud interpose it falls
again immediately : A-
gain, the *shell* is exceeding
light ; besides that, the
dew is sealed in it that it
cannot get out ; and even
this moves upwards to-
wards the *Sun*, not side-
ways

ways along the *Earth*. So that it must be concluded, that vapours cannot be serviceable to our purpose, so as to force whole veins of shels or other bodies to places so far distant from the *Sea*, and there to ram them in. It remains then, that this be effected by one or other of the former means.

As for exhalations; and that their force is such that can impetuously move bodies of the greatest weight, we need look no further than

than our Gun-powder, and the Machines or Engines that are used by or with it; such as Cannons, Bullets, Balls of Lead or Iron, Stones, Granadoes, &c. of which some, by the help of a cold and dry exhalation pent in the Niter or Salt-Peter, and suddenly by fire flying out, make as stupend refractions of the air, and obtain a violence equal to that of our usual thunder and lightnings. And after the same manner is their force and light caused,

C the

the violence and noise of *Aurum Fulminans*. And these exhalations which have such effects above, have the same strength under ground, as appears by *Earthquakes*, with which there are usually heard a

* *Terra mugit et tremuit*

* *murmur and sound*. When *Sempronius Gracchus* was

M. Cat. Quint. Mart. Coss. Fremitus infernus ad Cælum ferri visus M. Anton. A. Posth. Coss. Fremitus terra etiam Fasulis auditus M. Perpenn. Cai. Claud. Coss. The City *Ferrara* in the year 1570. was surprized with a fearful noise, as if it had been battered with great Ordinance, afterwards with a most violent trembling.

set-

setting on the *Piceni*, and
they were just joyning
battel ; * *tam horrendo fra-* * *Oros.*
gore terra tremuit, ut stupore *lib.4.*
miraculi utrumque pave- *cap.4.*
factum agmen hebesceret.

These make the Earth
tremble, the Mountains
rowl, the Rocks quake,
and especially if the *exha-*
lation that causeth them
be impregnate with *Nitro-*
sulphureous *Spirits*, which
have sometimes thrust
out *hills* where there were
plains, *Islands* in the midst
of Seas, made huge *Rivers*

where there were none,
turned the current of
some, stopped others, left
vast caverns and holes, de-
pressed Mountains, swal-
lowed Cities and Armies,
subverted Temples and
Palaces. Cizicus a City of
Misia minor, with the fa-
mous Temple of Jupiter
there, were both swallow-
ed in an Earthquake; and so
was Philadelphia another
City of the same Misia, and
one of the Churches St.
John writ to. Apoc. 3. 7. In
an Earthquake in Vinianfu
in

in China, the Nitrosulphureous spirits burst out of the Earth in such an actual flame, that it consumed the whole City and innumerable people. At Hien in the same Country, the fall of the houses by the same Earthquake flew eight thousand. At Enchinoen an hundred thousand perished. Immediately on the bitter persecution of Dioclesian, a fearful Earthquake happened in Syria, by which Tyre and Sydon were almost destroyed, and
C 3 many

*Oros.lib.
7.c.17.*

many thousands were kil'd.

*Lucan.
lib. 1.*

—— *Quatiente ruina*

Nutantes pendere domos. —

Or as the same Author elsewhere describeth an earthquake,

—— *Cardine tellus*

Subsedit, veterémq; jugis nutantibus Alpes

Discussere nivem. —

*Jos. Ant.
riq. l. 9.
c. 11.*

We read of one in *Judeah*, at *Uzzah's* usurpation of the Priests office, which rent the Temple, and a Hill in the *East* was removed four furlongs towards the *West*; of another in *Herods* Reign,

Reign, that slew ten thou-^{l. 15. c. 7.}
sand Jews. Marcley hill
with us in *Hereford-shire*,
Anno 1571. with a great
noise removed it self from
its place, and went con-
tinually for three dayes
together, overthrowing
Kinnaston Chapel, bearing
the earth 400. yards be-
fore it. And therefore
Exhalations may be grant-
ed to remove stones and
sands, and with them such
heterogeneous bodies as lie on
them, from one place to
another, from the sea to the
C 4 hills,

hills, from a coast far into a countrey. But *Earthquakes* are not frequent in any places unless near *Vulcanoes*, and are less usual in these parts; and yet in most places all over *Europe*, such heterogeneous bodies have been found under the Earth, at great distance from the Sea. Again, the force of *Exhalations* is most evident in mountainous, rocky countreys, because when they are pent into such places they cannot have vent; whereas these bodies

bodies are often found in
mosses, bogs, and marish
grounds, as frequently as
in other earth.

5. So that they are
most likely to be hurried
thither by the force of
waters, passing from the
Sea through the caverns
of the *Earth*. The reason-
ableness of which opinion
will the better appear, if
we consider that,

1. As the *Earth* is of a vast
compass, and no less than
7000 miles in *Diameter*, of
which the *Water* doth not

C 5

make

make above one third part of the *Globe*, and that on the *surface* of *Earth* too ; and so far as was ever yet discovered of the *Earth*, no part of it is destitute of some *mineral substance* continually generating in it, unless where either the *Sun* exhales the force of it, or *Nature* is otherwise employed in producing *Vegetables*. So that if the *Earth* be kept from the sight of the *Sun*, and the production of plants, nor is apt to other generations

tions, yet it fails not to produce *Saltpeter* or *Nitre* in good quantity. And this is the reason that *Saltpeter-men* dig in *Stables*, *Cellars*, and other houses. So that in the whole bowels of the Earth, what vast heaps, what mountains of *metalls* are there? Some *in fieri*, some *in facto esse*; perfect and imperfect; mean *metalls*, *Stones*, *Fluors* of all sorts, *Salts*, and concrete *Juices*; besides the several sorts of *Earths*, *Chalks*, *Boles*, *Bitumina*,
and

and the mixtures of all or any of these, of which it were much too large, and more besides my purpose particularly to discourse.

2. Where there are so vast and numerous generations, 'tis impossible that they should succeed without vast quantities of water. Nay, to speak more home, the first matter that hath been yet discovered of all *Minerals*, is no other than a certain *Juice* or *Water* impregnate with the *seminal vertue* of this or that

that *Mineral stone* or *Metall*,
which from *water* (when
it hath found a conveni-
ent *matrix*) becomes a *gel-*
ly, and from a *gelly* this or
that *stone* or *metall*. This
is obvious from several
springs, whose *water* im-
pregnate with the *seeds* of
stone, having found a place
of rest convert into perfect
stone. Of which sort, we
read of some in * *Hunga-*
ry, of others in *Peru* by * * *War-*
* *Acosta*. In *Guancavilica* ^{*ner. de*}
there is a *Fountain* that ^{*Aq.*}
turns into a *Rock*, with ^{*Hungar.*}
^{* *Acost.*}
^{*l. 3. c. 17.*}
which

which an whole village is built. At Newnham Regis in Warwickshire, our Geographers tell us of a Well that after the same manner turneth wood into stone; of another in the the North, that dropping from above into a Cave, becomes clear and very hard stone beneath. *Rivus est apud Scotos Ratra dictus, in cujus ripa est spelunca, in qua guttatim ex fornice distillans nnda lapidescit in metas, quæ nisi tollantur humana industria, spatium totum opplerent*

Bert.
Geog.
P. 127.

rent. Some Minerals are no other than certain kind of Juices accreted, as *Allum, Vitriol, &c.* And Mine-masters have sometimes found Metalls liquid and unconcrete when they have peirced a Mine too soon; *Matheſius* mentions liquid Silver found by some. And for this without doubt among other causes, is water by the *Ancients* called *Panspermia*; for that the seeds of things in the Earth have very little vertue without this,

this, *Moses* insinuates, *Gen.*
2.5. where he gives this
reason why no Plants yet
grew, viz. because they
lay in arido, for the Lord had
not caused it to rain on the
earth. I am very confident
that the Poets did not only
call *Venus* the Goddesse of
generation, *Αφροδίτη* & *Ζώνη*
the spume-born Goddesse,
from the saltness of the
spume, (though some of
later date have therefore
called her *Αλυσίνη*) but from
the waters that bare it.
Nor is there any question

to be made, but that the
Inhabitants of the waters
are therefore more nume-
rous than other creatures,
not for any saltness, which
at the most can
but * irritate to
copulation, but
doth not ren-
der the seed e-
ver the more
prolifical. For fresh water
fish are as multiplicative of
their species as the other in
proportion. There is not
a fish that swimmeth in
the deep that hath a grea-
ter

* *Aegyptii ideo à sale
abstinnerunt (teste
Plutarcho) quod sa-
lem venerem irritare
persuasum haberent. Le-
vin. Lemn. de Nat.
Miracul. l. 2. p. 228.*

ter quantity of spawn considering his bulk, than a Carp; yet it is a fresh water fish.

Nor can I believe there can any other reason be given, why the *Irish* women have so many Children, than because their Country, and consequently themselves, are so exceeding moist, as appears by their stature, their pale countenances, their flaccid, soft and phlegmatick habit of body. And indeed I think that it were as reasonable to seek for taste in
an

own an egg, as for salt in the *Ex ovo*
 man sperm of fish or any other *omnia.*
 fresh creature; for by virulent *Harv.*
 Gonorrhæa's it appears that And
 ere a sharp and saline quality, is what
 be a token rather of corrupti- taste is
 æn on than of any active and there in
 an generative energy. Et quod the
 nd *verissimum est dicimus*; No white of
 re *vimus* & jam nosco mulieres an egg?
 p- *varias conjugatas* sat juve- *Job.*
 ir *nes, quæ ab erroribus dietæ à*
 ic- *Pica sive Malacia causatis,*
 a- *præcipuè à salitorum, vel potiùs*
 I *ab incommisti salis esu, non*
 a- *tandum sordidos pallidos fæ-*
 n *tidosque obtinuerunt colores; cu-*
 n *tes*

tes impolitas & rugosas, ventriculos nauseabundos; verumetiam suffocatae omnino evaserunt & steriles. But although I attribute the effects above mentioned to water rather than salt; yet I would not be conceived to imbibe Thales Milesius opinion, that aqua is so named, *quasi à qua omnia*, as if all things were from it; and yet do believe that it is *causa sine qua non*, and a great nurse and fosterer of Generations, if not a Parent of them. And of Minerals

als too; especially if we should embrace the opinion of the *Peripateticks*, that all *mixed bodies* are immediately composed of the four *Elements*; for then these being the most *ponderous bodies*, must needs have in them the most *weighty Elements* in good quantity, and those are *Earth and Water*.

3. The *Sea* is the original of all *Waters*; nor could any fountain else afford enough to supply the *Earth* to all uses.

That

That which by the Neoticks hath lately been found out, of the Circulation of the Bloud and Humours in the Microcosm, was long since discovered (which might possibly hint that) in the greater world. *Eccles. i. 7*
All rivers run into the Sea yet the Sea is not full: unto the place from whence the rivers come, thither they return again. And what huge quantities of water must be necessary for the whole Earth, may be hence

hence inferred, that the
superficies of it needs so
much, that besides the in-
numerable Springs, Foun-
tains, Channells, Rivers
and Lakes with which it
is irrigated, were it not
for frequent showres
from above, would soon
be parched up, and un-
able to produce *sustenance*
for Man or Beast; which
help the bowels of the
Earth are destitute of;
for the moisture of *showres*
peirceth not above ten
foot deep at the most.
And

And indeed, this is the
only reason that can be
given of the Seas saltness
because it doth wash, and
so dissolve much salt from
the rocks of Salt in sub-
terranean caverns where
it doth pass, and would
long ere this have caused
places, where such rocks
have been, to sink in:
But that, first, there is a
continual generation and ac-
cretion, as well as a dissolu-
tion; and secondly, be-
cause that Salt is very
hard, in somuch that some
stones

stones of salt there are found in several waters undissolved; as those of which *Cambden* informs us in the River *Weere* near *Batterby* in the *Bishoprick* *Cambd.* of *Durham*. And as for *Brit.Br.* that dreadful story of *Lots* *gant.* wife turned into a pillar of salt, *Gen. 19.26.* as we are to believe the thing, so may it not be improbable that it was termed a pillar, as well for the *solidity*, *durableness*, and *difficulty* of *dissolution*, as well as for its *shape* and *form*; God
D striking

striking her in that manner, as a more *durable monument* of his anger against Disobedience. And our *glass* at this day is but *salt* after its *highest fusion*, and yet it is very *solid and durable*, and imports no quality to water. Thirdly and lastly, the *Sea-water* having imbibed so much *salt* before, is the less able to dissolve more.

4. That though the *Sea* on the coast near the shore, may communicate its waters by *perlocation*,
tion,

tion, yet to places at great distance it cannot pass so as to afford a due supply, but by *Gulphs* and *subterranean In-draughts*. In many places of the world they make the *sea-water* potable and *fresh* by digging of pits in the sand, into which the *sea-water* streining it self, leaves its *saltness* behind. But this must be done at no great distance from the *Sea*, and it must be in *sand* or *clay*, or the like; for if the shore be *rocky*,

it will not do ; as we see in many places where they dig a very great depth for *fresh water* near the *Sea*, and cannot be supplied till they find a *fresh spring*, a great many foot under the *surface* of the *Sea*. So we see that when we *filtrate* liquors through *shop-paper*, if it be thin and *bibulous*, it passeth ; if thick and too close, it will not pass. Some illustrate the *percolation* of the *sea-water* by this experiment. Take

a round ball of moist clay, make it hollow in the inside, fill it with salt water, lay it to the fire, and it will extill by the pores of the clay, and become fresh and insipid.

Now that there are vast gulphs and chanel's from the sea under the earth, will easily appear, when we consider, that some great lakes and oceans there are, that have no other way to vent themselves. What way can the Caspian Sea exonerate it self

D 3

by,

by, after it hath taken into it *Volga*, *Jaxares*, *Ochus*, *Oxus*, and other huge Rivers? What other reason can be given why some lakes are full of sea fish, and yet at great distance from the Sea? In *Bainoa*, a Province of *Hispaniola*, is a lake of salt water which hath 24 Rivers running into it, yet never increaseth, and hath *Sharks* and other sea-fish in it. Again, there are salt springs in all Countreys that ebbe and

and flow as the Sea and the Coasts do. There are also salt rivers, as Ochus and Oxus; salt lakes, as that before mentioned. Besides this, it is ordinary for chanel and rivers to run a great way on the earth, and then to ingulp themselves. The waters of the Cirknickzerksey ^{Georg. Winc.} lake in Carniola, gush with ^{rus.} that violence and swift-ness out of the ground, that they will overtake a swift Horse-man, and presently are swallowed

in a deep gulph again. In the Province of *Caz-
cium* in *Hispaniola* is a
great cave in an hollow
rock, under the root of a
very high mountain, in
which divers Rivers, af-
ter they have run four-
score and ten miles, pass as
into an indraught, and
are swallowed up. In
most Countreys we read
of the like. A moun-
tain there is in *Caermar-
then-shire*, where *Careg-
castle* sometimes stood,
in which are many spa-
cious

cious holes and wide caves,
with a Well that ebbs and
flows as the Sea on the
Coast doth, twice in four
and twenty hours. The
Current of one and the
same Sea in several parts
contrary ways demon-
strates this, as in the
Atlantick Sea, in some
places from, and in some
places towards the North,
like Liquor in a fun-
nel. In some places there
are whirlepoools, whose wa-
ters turn clean round, in-
somuch that if a Ship at
D γ such.

Such an one there is in the North Sea, near the coast of Norway. Such times come over them, they are in most extreme danger of *sinking*: At other times the waters with that *violence* come out of the earth, that a Cannon cast over-board will not *sink*. This caused *Taurellus*, and some others, to think these the onely cause of the *Tides*. *Moral.* *Andreas Moralis* on the Coast of *Hispaniola* was sucked into *Whirlpools*, where with that *violence* the water was drawn into the earth, that with

with extraordinary toil the Ship hardly escaped sinking. Again, the heterogeneous bodies that are found so deep, are such usually that either are generated, or most usually dwell in the Sea; as shells, bones of fish, masts, anchors, parts of ships. At Berna ^{Simplerus} in Switzerland, Anno 1460. ^{Orielius} fifty fathom deep, in a Mine where they got metall-oar, a ^{Fracastrorius} Ship was digged up, in which were forty eight carkases of Men, with other merchandise. Out of the Ocean into

In Greenland a Mast into the Medi-
was digged out of the terranean Sea,
top of an high Hill
with a fully hanging there is a con-
to it. tinual current

by the streights of Gibraltar ; another Current into the same out of the Euxine Sea, by the Thrasian Bosphorus ; besides ; very many and great Rivers. And which way can it exonerate it self? for those vast flouds do not increase it. And Solomons Circulation of humours in the Macroccsm above mentioned, is very

ry considerable; nor is the *Analogy* in this particular between that and the lesser World obscure. For the *Sea* in that answereth to the *Fountain of blood* in this. The *Subterranean Rivers*, and those above ground, may answer to the *vessels* containing the *blood*. And both these answer to the *Vasa attrahentia, & deferentia*; for the *subterranean chanel*s carry the *water* from the *Sea*, the *Rivers* return it to the *Sea*.

Again,

Again, as both sorts of vessels are greater near the fountain of bloud in the body; so are the chanelles biggest nearest the Sea their fountain; and though it may sometimes happen otherwise, yet if the banks of any are wider, so that they look like lakes a great while before they discharge themselves into the Ocean; I look on it but as *casuall*, and bearing proportion with the *divarications* of vessels in mans body. Again,
vessels

vessels in our bodies are from *trunks* (like trees) branched out, in *ramulos*, *surculos*, and other minute *distributions* (answering to the *stalks* of leaves or fruits) which are again subdivided into *capillary conveyances*, and thence the *bloud* and *humours* pass *per poros* for the nutriment of the *solid parts*; so are the *Rivers* above (and without doubt the *channels* under ground in proportion to them) from their main *trunks* divided into

into Brooks, those Brooks into Rivulets, these into lesser conveyances as it were capillary vessels, and every where dispersed and disseminated according to the exigence of nature, and thence passe through the pores of the Earth, that no part may be destitute of a due supply for the Generation and increase of all bodies. Again, the *æstus maris* bears some proportion to the pulse of the blood in the Microcosm, the ebbing and contraction of

of the water is the *systole*; the *turgescency*, floating, and dilatation of the water, is the *diastole*; the space between both the *perisystole*. Again, as in the heart and in some vessels only that carry the blood that motion is to be found; so is the *æstus* discovered in some vessels only that convey the humour of the greater World. Not that I look on this as any kind of proof, but as an *illustration*, the better to guide our conceptions
in

in Natures *Water-works*, by what is seen that we may the better understand that which is not seen, or at least not so plainly. However enough to our purpose it is, that such *Subterranean chanel*s there are from the Sea under the *Earth*. As for the common *scruple* of the improbability of the *waters* rising so high out of the Sea to the *superfice* of the Earth, it is the least hindrance of an hundred; for if there be

ks, a continuity of the air,
we waters will rise as high as
er- the surface of the waters
ot from whence they came,
fo as appears in *Siphunculis*;
e- and therefore may rise
it to the tops of the highest
al hills. For the highest
e places of the Sea answer
s to the tops of the loftiest
le mountains, or else the

of earth could not
b be spherical. To
- this the *Psal-*
s mist is conso-
n- nant, *Psalme*
e 104. The wa-

*Were it not for bounds
God hath set, the wa-
ters are high enough
to turn again and co-
ver the earth, v. 9. He
hath Chambers or
Receptacles by which
to water the hills, v. 13*

ters

ters go up by the Mountains, they go down by the Valleys unto the place which thou hast founded for them. With what violence do the waters gush out of Saint Winifreds Well in Wales on the top of a great hill? Again, compression of those vast quantities of water forcing them into Earth, may make them mount the higher; as Hoggsheds full and newly broached run the faster. I'll illustrate this by the following.

lowing experiment. Take two round Boards equally sized, fasten strong Leather to those Boards above, below, and on the sides so close that they may hold water; from the lower board let an hollow pipe go up on the out-side higher than the upper board; fill this instrument with water; then put a weight on the upper board, and proportionable to the weight so will the waters mount
to

to a greater or lesser height; as in this Figure.



A. The upper board.

B. The lower board.

ccc. The Leather on every side.

D. The

cer
re. D. The Pipe through
which the water will leap up-
wards.

E. The weight of com-
pression.

But it may be object-
ed, that this is an adven-
titious and external com-
pression; and not that of
the water onely. But I
answer, that such a
compression there is in
the Sea from agitation of
the waters by wind, and
other causes; and yet
that waters by their own
na-

natural compression will mount higher than the brims of the vessel containing, may be evident from this, that if we take one of a considerable capacity, with a pipe on the outside something higher than its brims; and rub the brims with Rosin, or such like Gum, and then fill it full till no more water can be poured in, stopping the orifice of the pipe in the mean time with ones finger, then removing the fin-

finger, it will presently
burst out at the *pipe*. It
may be demanded then,
Why are not all Rivers
salt? To this I an-
swer; That most of them
have their waters *stopped*
and *percolated*, and so
leave their *saltnesse* be-
hind. But as for those
that have no hinderance,
they are not onely *salt*,
but do constantly *ebbe*
and *flow*, as hath been ex-
emplified already. Those
that have a stoppage by
a *bank* of *earth* to such an
E *beighth*

See Or-
tel. map.
epitomi-
zed in
the de-
scription
of Gades.

height only, issue fresh water at their ebbe, and at their fote salt; as that fountain in the Isle of Gades doth. Those that are salt, and have no tides, are such as after percolation wash some rocks of salt before their eruption.

5. Where mighty flouds come with violence, as these must of necessity do by reason of the vast quantity, the mighty compression, and the unspeakable weight of the waters
of

of the *Ocean*, they will easily carry with them *light*, and with no great difficulty *ponderous bodies*. This needs not, and therefore shall not, have any proof.

6. *Heterogeneous bodies* by the weight and strength of *waters* forced into a narrow place, cannot easily by the return of those beyond them, (if they return at all the same way) be brought forth again. Because there is little or no *compression*, and

E 2 there-

therefore the return of the water is *leasurely*, and by *degrees*. This is obvious to Sense, and therefore needs no *illustration*.

7. And as much evident to sense it is that any *heterogeneous* bodies so remaining *unremoved*, soon gather *slime* and *sand* about them, and in a small space of time are lodged as it were in *firm ground*. This is no more wonderful than to have any *vessel* in the *Microcosm*.

cosm obstructed by crude and heterogeneous bodies, *cæteris paribus*. Nor need we seek for rare Water-works; for every ordinary gutter and sink will demonstrate this.

And thus (Doctor) you have my Opinion of the way by which those Cockle, Muscle, and Oyster-shells you mentioned, were brought and lodged in that place. If they were truly shells, they were conveyed either above or under ground;

E 3 but

but not so usually above, therefore under. If under ground, then by natural or voluntary agents. If by natural and necessary, then either by *Vapours*, *Exhalations*, or *Waters*; but this is done usually and commonly by none of the former, therefore by the last; which is the more likely to effect it,

1. Because there are numerous generations in the Earth.

2. Where many generations are, much water is necessary.

3. No

3. No fountain can supply the earth to these purposes but the Sea, which is the original of all waters.

4. Though the Sea communicate his waters to places near it by percolation; it must and doth supply that afar off by whole floods, gulphs and indraughts.

5. Where mighty floods come with violence, they will carry very weighty bodies with them.

6. Heterogeneous bodies are not easily brought back

back again when they are forced into a narrow place.

7. But in a little time gather *slime*, and *earth* about them, and so are lodged in firm ground.

Psal. 139. 14.

*Marvellous are thy works
(O Lord) and that my soul
knows right well.*



